DETAILED ACTION

1. Applicants' 02/28/2008 Amendment, which directly amended claims 1, 6; and traversed the rejection of the claims of the 11/08/2007 Office Action are acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarangapani (IDS reference – 6,055,042) in view of Gunderson et al (6,642,839).

Regarding claim 1, Sarangapani discloses a method of preventing a mine vehicle from colliding comprising: determining for the mine vehicle at least one safe area (i.e. zone of interest) provided within an area between minimum distances (i.e. near range) and maximum

distances (i.e. far range) determined with respect to the vehicle (Fig 2 "204, 208"; Fig 3 "308"; Fig 4-5 "406, 408"; col 3, lines 6-60; col 4, line 35 – col 5, line 22); scanning the environment in front of the vehicle when driving the vehicle in one movement direction (Fig 3-7; Fig 8 "802"; col 3, lines 6-60; at least col 4, line 35); carrying out a first collision examination wherein the safe area in front of the vehicle is monitored (Fig 8 "804-812"). Sarangapani does not explicitly disclose the steps of determining also at least one sideward safe area for the vehicle, determining an obstacle-free route on the basis of scanning results, and determining points in a sideward direction of the vehicle to restrict the route; forming memory points on the basis of coordinates of the points restricting the route, and storing the memory points in the control system; and carrying out a second collision examination wherein at least one sideward safe area of the vehicle is monitored and issuing collision warning messages if an obstacle is detected within the safe areas and if even one of the memory points resides within the safe area being monitored. Gunderson et al teach in the same field of endeavor the steps of determining also at least one sideward safe area (i.e. broadly interpret as predetermined distance of obstacle / object to vehicle) for the vehicle (col 6, line 44 – col 7, line 10); determining an obstacle-free route on the basis of scanning results (i.e. broadly interpret as any object is not within a predetermined distance is considered as obstacle-free route) (col 6, line 44 – col 7, line 10); and determining points in a sideward direction of the vehicle to restrict the route (i.e. broadly interpret as predetermined distance from an obstacle / object to vehicle) (col 6, line 44 – col 7, line 10); carrying out a second collision examination wherein at least one sideward safe area of the vehicle is monitored; and issuing collision warning messages if an obstacle is detected within the safe areas (i.e. front, side, or rear) (col 6, line 44 – col 7, line 10; col 8, line 26+; col 9, line 40+).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such steps as taught by Gunderson et al in the method of Sarangapani because it does no more than yield predictable results of preventing collision for a vehicle since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

Still regarding claim 1, although Gunderson et al do not also disclose forming memory points on the basis of coordinates of the points restricting the route, and storing the memory points in the control system; and carrying out a second collision examination wherein at least one sideward safe area of the vehicle is monitored and issuing collision warning messages if even one of the memory points resides within the safe area being monitored as claimed. However, Gunderson et al disclose the side sensors in conjunction with the processor that are used for detecting any obstacle / object at any moment that present a hazard if they are within the predetermined distance to the vehicle and issue collision warnings (col 6, line 44 – col 7, line 10; col 8, line 26+; col 9, line 40+). It would have been an obvious matter of design choice of forming memory points on the basis of coordinates of the points restricting the route, and storing the memory points in the control system; and carrying out a second collision examination wherein at least one sideward safe area of the vehicle is monitored and issuing collision warning messages if even one of the memory points resides within the safe area being monitored as claimed, since applicant has not disclose such steps solves any stated problem. It appears that the invention would perform equally well with the method as taught by Gunderson et al.

Regarding claim 3, see the rejection of claim 1 above regarding the memory points as claimed.

Regarding claim 6, Sarangapani discloses in Fig 1-7 a mine vehicle (i.e. mining truck) comprising at least: a movable carrier (i.e. mobile machine 102) that is driven in a first movement direction and in a second movement direction, at least one scanner (i.e. near range obstacle sensor 204; far range obstacle sensor 208), and a control system (i.e. control system 212) including at least a first control unit arranged on the carrier (col 2, line 53 - col 3, line 13); and wherein at least one scanner is configured to scan the environment in front of the vehicle in order to detect obstacles (col 3, lines 6-60; at least col 4, line 35); at least one safe area (i.e. zone of interest 308, 406, 408) defined by minimum distances (i.e. near range) and maximum distances (i.e. far range) determined with respect to the vehicle is determined in the control system (col 4, line 48 - col 5, line 13); and which control system is configured to monitor scanning results (Fig 8 "804-812"). Sarangapani does not explicitly disclose at least one safe area in a sideward direction of the vehicle is further determined, the control system allows several memory points including their position information to be stored therein the memory points defining sideward points of the route and based on the scanning results, and the control system is configured to monitor at least one sideward safe area of the vehicle and to issue a collision warning message if an obstacle is detected within the safe area in front of the vehicle and if even one of the memory points resides within the safe area being monitored. Gunderson et al teach in the same field of endeavor at least one safe area in a sideward direction of the vehicle is further determined (i.e. broadly interpret as predetermined distance of obstacle / object to vehicle) (col 6, line 44 – col 7, line 10); the control system is configured to monitor at least one sideward safe area of the vehicle and to issue collision warning messages if an obstacle is detected within the safe areas (i.e. front, side, or rear) of the vehicle (i.e. front, side, or rear) (col

6, line 44 – col 7, line 10; col 8, line 26+; col 9, line 40+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such safe area and control system s as taught by Gunderson et al in the system of Sarangapani because it does no more than yield predictable results of preventing collision for a vehicle since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

Still regarding claim 6, although Gunderson et al do not also disclose the control system allows several memory points including their position information to be stored therein the memory points defining sideward points of the route and based on the scanning results; and the control system is configured to monitor at least one sideward safe area of the vehicle and to issue a collision warning message if even one of the memory points resides within the safe area being monitored as claimed. However, Gunderson et al disclose the a control system in which side sensors in conjunction with the processor that are used for detecting any obstacle / object at any moment that present a hazard if they are within the predetermined distance to the vehicle and issue collision warnings (col 6, line 44 – col 7, line 10; col 8, line 26+; col 9, line 40+). It would have been an obvious matter of design choice of storing the memory points in the control system; and the control system is configured to monitor at least one sideward safe area of the vehicle and to issue a collision warning message if even one of the memory points resides within the safe area being monitored as claimed, since applicant has not disclose such steps solves any stated problem. It appears that the invention would perform equally well with the method as taught by Gunderson et al.

Regarding claim 7, Sarangapani discloses in Fig 3-5 the scanners (i.e. near and far range obstacle sensors) directed in a first movement direction and provided with a safe area of its own (col 5, line 35 – col 6, line 23). Sarangapani does not explicitly disclose the scanner directed in a second movement direction and provided with a safe area of its own. Gunderson et al teach in the same field of endeavor a laser scanner directed in a second movement direction (i.e. side, rear) and wherein each movement direction is provided with a safe area of its own (Fig 9-12; col 6, line 44 – col 7, line 10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such safe area and control system s as taught by Gunderson et al in the system of Sarangapani because it does no more than yield predictable results of scanning the obstacle / object surrounding the vehicle for collision detection since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sarangapani modified by Gunderson et al as applied to claim 1 above, and further in view of Ishida et al (IDS reference – 5,572,428) and Sturges et al (IDS reference - WO 02/030792).

Regarding claim 2, Sarangapani modified by Gunderson et al do not explicitly disclose the steps of simulating in advance, on the basis of position and control data, the path of movement of at least one part of the vehicle in the control system; carrying out the second collision examination by taking into account the path of movement obtained by simulation; and adjusting, on the basis of the second collision examination, steering movements of the vehicle in order to avoid overstepping the sideward safe area. Ishida et al teach in the same field of endeavor the steps of simulating in advance, on the basis of position and control data, the path of

movement of at least one part of the vehicle in the control system; carrying out the second collision examination by taking into account the path of movement obtained by simulation (Fig 2 "S3-S11; at least col 5, line 40). Sturges et al teach in the same field of endeavor the step of adjusting, on the basis of the second collision examination, steering movements (i.e. turn moments) of the vehicle in order to avoid overstepping the sideward safe area (Fig 9; pages 18-21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such steps as taught by Sturges et al and Ishida et al in the method of Sarangapani modified by Gunderson et al for determining and controlling the potential collision of the sideward area of the vehicle since it has been held that if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill (MPEP 2143).

6. Claims 4-5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarangapani modified by Gunderson et al as applied to claims 1 and 6 above, and further in view of Burns (IDS reference – 6,393,362).

Regarding claim 4, Sarangapani modified by Gunderson et al disclose the step of controlling the vehicle unmannedly (**Sarangapani** – col 2, lines 58-61; col 4, line 55+; col 6, line 63+). Sarangapani modified by Gunderson et al do not explicitly disclose the step of utilizing a data transmission connection provided between the first control unit residing on the carrier of the vehicle and a second, external control unit. Burns teaches in the same field of endeavor in Fig 10 the step of utilizing a data transmission connection provided between the first control unit (i.e. control modules 80) residing on the carrier of the vehicle and an external control unit (i.e. base

station 76) (col 9, lines 1-27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such step as taught by Burns in the method of Sarangapani modified by Gunderson et al because it does no more than yield predictable results of preventing collision for a vehicle since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

Regarding claim 5, Sarangapani modified by Gunderson et al do not explicitly disclose the step of updating dimensions of at least one safe area on the basis of the location of the mine vehicle. Burns teach in the same field of endeavor the step of updating dimensions of at least one safe area (i.e. safety envelope) on the basis of the location of the mine vehicle (col 5, line 24 – col 6, line 67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such step as taught by Burns in the method of Sarangapani modified by Gunderson et al because it does no more than yield predictable results of preventing collision for a vehicle since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

Regarding claim 8, Sarangapani modified by Gunderson et al do not explicitly disclose the minimum distances of the safe area are determined according to the external shape and structure of the mine vehicle. Burns teach in the same field of endeavor the minimum distances of the safe area (i.e. minimum physical operating space) are determined according to the external shape and structure of the mine vehicle (col 5, line 35 – col 6, line 67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the

safe area determination as taught by Burns in the system of Sarangapani modified by Gunderson et al because it does no more than yield predictable results of preventing collision for a vehicle since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

Regarding claim 9, Sarangapani modified by Gunderson et al disclose the mine vehicle is unmanned (**Sarangapani** – col 2, lines 58-61; col 4, line 55+; col 6, line 63+). Sarangapani modified by Gunderson et al do not explicitly disclose the first control unit is through a data transmission connection connected to a second, external control unit in order to transfer control data between the control units. Burns teach in the same field of endeavor in Fig 10 the first control unit (i.e. control modules 80) is through a data transmission connection connected to a second, external control unit (i.e. base station 76) in order to transfer control data between the control units (col 9, lines 1-27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such data transmission for the control units as taught by Burns in the system of Sarangapani modified by Gunderson et al because it does no more than yield predictable results of preventing collision for a vehicle since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

Regarding claim 10, Sarangapani modified by Gunderson et al do not explicitly the control system is configured to update at least one safe area on the basis of the location of the mine vehicle. Burns teach in the same field of endeavor the control system is configured to update at least one safe area (i.e. safety envelope) on the basis of the location of the mine vehicle (col 5, line 24 – col 6, line 67). It would have been obvious to one of ordinary skill in the art at

the time the invention was made to incorporate such control system as taught Burns in the system of Sarangapani modified by Gunderson et al because it does no more than yield predictable results of preventing collision for a vehicle since it has been held that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results (MPEP 2143).

While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

Response to Arguments

7. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong P. Nguyen whose telephone number is 571-272-3445. The examiner can normally be reached on M-F, 8:00 - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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